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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MATTHEW B. BUCZEK, ANDREW JAY SKOOG,  
JANE ANN MURPHY, DANIEL GUSTOV BACKMAN,  
ISRAEL S. JACOBS and JOHN FREDERICK ACKERMAN

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Appeal 2008-1468  
Application 10/663,320  
Technology Center 1700

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Decided: April 25, 2008

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Before THOMAS A. WALTZ, ROMULO H. DELMENDO, and  
LINDA M. GAUDETTE, *Administrative Patent Judges*.

WALTZ, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek review under 35 U.S.C. § 134 from the Examiner's final rejection of pending claims 17-19, 21-23, 26-28, 30-32, 34, 36, 38 and 39. Claims 1-19 were originally filed. Claims 17-19 were amended during

prosecution, and claims 21-39 were added. Claims 1-16, 20, 24-25, 29, 33, 35, and 37 have been cancelled. The remaining claims pending stand rejected. This Board has jurisdiction under 35 U.S.C. § 6(b).

The invention disclosed in the application under appeal is directed to a method of orienting non-spherical metal particles in a coating medium with respect to the surface of a coated article. Independent claim 17 is illustrative and is reproduced below:

17. A method for orienting with respect to an article surface a plurality of non-spherical particles, comprising the steps of:

disposing non-spherical metal particles in a non-metallic medium having a viscosity which can be increased, each particle including a major dimension, and each particle being capable of being moved by a force applied to each particle;

the medium being in a fluid condition with the viscosity selected to provide a selected surface tension in the medium;

disposing the medium with the particles on a surface of a gas turbine engine component article, the article surface having a complex, three-dimensional, non-planar shape; and

maintaining the medium in the fluid condition for a time selected to enable the surface tension to locate at least about 50% of the plurality of particles with the major dimension in a position generally along the article surface in respect to which each

particle is disposed, the particles being physically separated from one another.

#### REJECTIONS UNDER REVIEW

Appellants have requested review of the following rejections in the final Office Action, dated Sep. 1, 2006:

1. Claims 17-19, 21-23, 26-28, 30-32, 34, 36, 38 and 39 stand rejected under 35 U.S.C. § 112, first paragraph, for lack of written description. Specifically, the Examiner found a lack of written description for the limitation “the particles being physically separated from one another” recited in independent claims 17, 26 and 32. The remaining claims depend on and include this limitation from one of the independent claims.

Appellants argue the claims as a single group. Therefore, they stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Claim 17 is selected as representative of the group.

2. Claims 17-19, 21-23, 26-28, 30-32, 34, 36, 38 and 39 stand rejected under 35 U.S.C. § 112, first paragraph, for lack of enabling disclosure. Specifically, the Examiner found a lack of enabling disclosure for the limitation “the particles being physically separated from one another” recited in independent claims 17, 26 and 32. The remaining claims depend on and include this limitation from one of the independent claims.

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## LEGAL PRINCIPLES

### *35 U.S.C. § 112, 1<sup>st</sup> paragraph – Written Description*

35 U.S.C. 112, first paragraph, requires a written description of the invention which is separate and distinct from the enablement requirement. The purpose of the written description requirement is broader than to merely explain how to “make and use,” the applicant must also convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991).

Drawings alone may provide a written description of an invention as required by § 112. Whether the drawings are those of a design application or a utility application is not determinative. *Id* at 1565.

A Specification need not describe what is well known by those skilled in the art to satisfy the written description requirement of § 112, 1<sup>st</sup> paragraph. However, unless the information is well known in the art, the application itself must contain this information; it is not sufficient to provide it only through an expert’s declaration. *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991).

The written description must be commensurate with the scope of the claims. *In re Wertheim*, 541 F.2d 257, 263 (Fed. Cir. 1976). In a written description analysis, the Examiner has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the

disclosure a description of the invention defined by the claims. *Id.* The burden placed on the Examiner varies, depending on what the Applicant claims. If the Applicant claims embodiments of the invention that are completely outside the scope of the specification, then the Examiner need only establish this fact to make out a prima facie case. *In re Alton*, 76 F.3d 1168, 1175 (Fed. Cir. 1996). Applicant then has the burden of showing that the embodiments of the claimed invention beyond those explicitly described in the specification are inherent in those described. *Wertheim*, 541 F.2d at 263.

The question of whether the patent specification provides adequate written description of the subject matter of claims is an issue of fact. *In re Alton*, 76 F.3d at 1174.

### *35 U.S.C. § 112, 1<sup>st</sup> paragraph – Enabling Disclosure*

Under § 112, 1<sup>st</sup> paragraph, a specification must disclose to those skilled in the art how to make and use the full scope of the claimed invention “without undue experimentation.” *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993), *In re Wands*, 858 F.2d 731, 735 (Fed. Cir. 1988). § 112, 1<sup>st</sup> paragraph, requires that the scope of protection sought in a claim bear a reasonable correlation to the scope of enablement provided by the specification. *In re Fisher*, 427 F.2d 833, 839 (CCPA 1970). Nothing more than an objective enablement is required, and therefore it is irrelevant whether this teaching is provided through broad terminology or illustrative examples. *In re Marzocchi*, 439 F.2d 220, 223 (CCPA 1971).

The term “undue experimentation” does not appear in the statute but it is well established that enablement requires that the specification teaches those of ordinary skill in the art to make and use the invention without undue experimentation. Whether undue experimentation is needed is not a simple factual determination, but rather it is a conclusion reached by weighing many factual considerations. *Wands*, 858 F.2d at 737. Factors to be considered in determining whether a disclosure would require undue experimentation include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *Id.*

#### ISSUES ON APPEAL

1. Have Appellants established that the Examiner reversibly erred in rejecting the claims under § 112, 1<sup>st</sup> paragraph, for failing to provide adequate written description of the limitation “the particles being physically separated from one another?”
2. Have Appellants established that the Examiner reversibly erred in rejecting the claims under § 112, 1<sup>st</sup> paragraph, for failing to provide an enabling disclosure for the limitation “the particles being physically separated from one another?”

### FINDINGS OF FACT (“FF”)

1. The present invention described in the application under review is directed to a method of applying a coating including non-spherical particles, such as flakes. (Spec. 1).

2. One embodiment of the invention uses metallic non-spherical particles for controlling brightness of the coating. (Spec. 1).

3. The Specification discloses various means for orienting the non-spherical particles such that their major dimension is parallel to the surface of an article coated. (Spec. 3:21-22).

4. Orientation of the non-spherical particles is described in the Specification as rotation. (Spec. 8:6).

5. Various means may be used to orient or rotate the non-spherical particles, including use of magnetic fields or induced flow, (Spec. 10:26, 11:7-15), gravity, (Spec. 12:1-5), and surface tension, (Spec. 14:9-21).

6. The viscosity of the medium in which the non-spherical particles are dispersed may be increased through, e.g., curing, thereby fixing the orientation of the non-spherical particles. (Spec. 5:21-23, 3:5-7).

7. The Specification does not describe means for translational movement of a non-spherical particle through the medium parallel to the surface on an article coated.

8. The Declaration of Andrew J. Skoog, Exhibit 1, dated June 21, 2006 (hereinafter “Skoog Decl. I”) states that the medium material contacts the particle and forms a barrier layer, which impedes particle-to-particle



contact and allows movement of the individual particles within the medium (Skoog Decl. I, p. 1). Skoog further states that the physical separation of the particles within the coating medium is due to surface tension of the selected particle and the viscosity of the coating medium (*Id.*). Skoog does not provide any empirical relationship between these variables, nor cite any sources supporting these contentions. The Specification makes no mention of a barrier layer.

9. Neither the Specification nor Skoog Decl. I describe how surface tension, interfacial tension or contact angle between the medium and the particles relate to formation of a barrier layer sufficient to separate and maintain separation between particles.

10. The Declaration of Andrew J. Skoog, Exhibit 2, dated October 21, 2006 (hereinafter, “Skoog Decl. II”) states that physical separation between the particles is shown, inter alia, in Figures 5-10. These figures show a physical gap or spacing between the indicated particles.

11. In Skoog Decl. II, the Declarant contends that the Specification provides sufficient disclosure to one skilled in the art to select materials and conditions to make a coating medium which would form a barrier around the particles, specifically citing aluminum containing ferromagnetic material (Spec. 12:7-8) where magnetic cores are explicitly identified (Spec. 6:7-8).

12. The material identified at Spec. 12:7-8 is for “a soft Fe-Co-Al type of ferromagnetic material, comprising nominally by weight about 48% Fe, 40% Co and 12% Al.”

13. The Specification at Spec. 6:7-8 states, “the particles can be or have a core of a magnetic material; typical of which is a metal based on Fe, Ni or Co or their alloys.”

14. The Specification provides no teaching on the desirability of or the method for forming an oxide layer on the non-spherical metal particles.

15. One objective of the invention is control of brightness or reflectance of the coating. (Spec. 1:6-14).

## DISCUSSION

### *35 U.S.C. § 112, 1<sup>ST</sup> paragraph – Written Description*

The Examiner contends that the claim limitation “the particles being physically separated from one another” is new matter, as particle separation is not discussed in the Specification and Fig. 10, as a drawing, does not limit the invention. (Ans. 4).

Appellants do not explicitly dispute the Examiner’s contention that Fig. 10 was “merely an exemplary drawing”, but contend that this has no relevance as the whether the drawing provides support for the limitation “the particles being physically separated from one another.” (App. Br. 10). Appellants provided annotated drawings, pointing out how the drawing shows particles physically separated in the medium. To this the Examiner replies that the Specification lacks any guidance or description concerning physical separation of the particles depicted in Figure 10 (Ans. 8).

We agree with Appellants. Written description and enablement are *separate and independent* requirements under § 112, first paragraph. *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 921 (Fed. Cir. 2004), *reh'g denied*, 375 F.3d 803, *cert. denied*, 543 U.S. 1015 (2004).

A drawing alone may provide sufficient evidence to one skilled in the art that the inventor had possession of the invention at the time of filing the application. *Vas-Cath Inc.*, 935 F.2d at 1565. Nothing in § 112 jurisprudence requires a disclosure in a drawing to be further supplemented or annotated by descriptions in the Specification. Nor does it require that all disclosed embodiments, as opposed to exemplary embodiments, provide written description. Fig. 10 depicts the coating with spacing between particles. *See* FF5. Therefore, we determine that the Examiner has not met the burden of showing evidence or reason why one skilled in the art would not recognize in Fig. 10 a description of the claim limitation. *Wertheim*, 541 F.2d at 263. The Examiner's rejection under the written description requirement of 35 U.S.C. § 112 is not sustained.

*35 U.S.C. § 112, 1<sup>st</sup> paragraph – Enablement*

The Examiner rejected the pending claims for failure to provide an enabling disclosure, contending that there is no teaching in the Specification enabling one skilled in the art to make and use the invention. Specifically, the Examiner contends there is no teaching of how to make and maintain the particles physically separated from one another. In a typical fluid medium containing non-spherical particles, the particles would be distributed

randomly, resulting in at least some portion of particles touching an adjacent particle. The Examiner concludes that one of ordinary skill in the art would require undue experimentation to achieve the claimed invention. (Ans. 3).

Appellants acknowledge that at least some combinations of non-metallic medium with non-spherical metal particles would not result in a fluid condition where the particles are physically separated. However, the combinations of non-metallic medium and metal particles resulting in physical separation are within the scope of the independent claims. (App. Br. 5).

The Examiner contends that even with Appellants' arguments and declarations, the claims include combinations of medium and metal particles that do not have barriers, and therefore the scope of the claim is not commensurate with the enablement. (Ans. 5).

We find the Examiner's arguments more persuasive. While the Specification provides combinations of particle compositions and medium compositions that, as Appellants contend, would result in the claimed particle spacing, the claimed invention is not limited to any particle or medium composition of comparable specificity as the examples. Nor are the claims limited in any way with respect to particle identity or shape, its relative content to the medium, or identity of the medium. The claims broadly recite metal non-spherical particles disposed in a non-metal medium.

Appellants also argue that the two Declarations of Andrew Skoog provide explanations of the physical separation of the particles. Appellants

contend that Skoog Decl. I explains that the physical separation is due to surface tension and viscosity of the coating medium. However, in the Specification, surface tension is referenced only in terms of orienting the particles within a thin layer. The Specification does not mention use of this surface tension to maintain spacing between the particles, as well as how to control surface tension to achieve a desired setting. (*See* FF 8). Skoog only makes conclusory remarks that spacing is maintained by surface tension. *Id.* (Skoog Decl. I, p. 1, ¶ 5). Skoog does not cite any references showing this to have been well known in the field, nor does he explain just how surface tension affects particle spacing, what values or ranges of values of surface tension are recommended to achieve the claimed particle separation and how one skilled in the art would select combinations of medium and particle material, in a wide variety of relative contents, to achieve a desired surface tension.

Appellants further argue that one skilled in the art would recognize that metal alloys containing aluminum would naturally form an oxide layer and that this oxide layer is in addition to the particle material (App. Br. 7). Appellants explicitly reference paragraph 7 of Skoog Decl. II, which contends that any skilled artisan would recognize that alloys containing greater than 4% aluminum form a protective oxide layer when exposed to the atmosphere. However, the claim recites generally metal non-spherical particles and is not limited to any metallic alloy, aluminum or otherwise. The Specification does not teach that an oxide or other such “barrier layer” must be formed on such metal particles, nor are the claims so limited. No

teaching is provided of how to create or provide such an oxide layer (*see* FF 14). There is no teaching that epoxies and other organic polymer resins suitable for the medium are capable of oxidizing aluminum alloys. The Specification teaches neither the necessity of, nor the procedures for, the formation of an oxide layer prior to or within a non-metallic, organic medium. Further, one object of the invention is to provide means for controlling brightness or reflection from the coating by orienting the particles. (*See* FF 15). This objective would be rendered moot if the metal particles had a relatively nonreflective oxide barrier layer.

Accordingly, we first determine that the Examiner has provided a reasonable explanation to support a finding that the Specification does not provide a disclosure enabling one skilled in the art to practice the invention as claimed. Therefore the Examiner has met the initial burden of establishing a *prima facie* showing that the appealed claims are unpatentable under 35 U.S.C. § 112, first paragraph, for lack of enabling disclosure.

We next determine that Appellants have failed to rebut the reasonable explanation provided by the Examiner. Appellants have failed to produce persuasive evidence that a person having ordinary skill in the art would be able to make and use the invention as broadly claimed without undue experimentation. Other than the several examples cited in the Specification, Appellants do not point to any teaching in the Specification by which one skilled in the art would select or use particular combinations of compositions for particles and media falling within the broad scope of the claims to achieve the claimed limitation. Appellants have even acknowledged that

some combinations of metal particles and non-metallic medium would not necessarily form the claimed spacing limitation, even though the combination of materials is within the claim scope. (App. Br. 5). Despite this concession, Appellants failed to produce evidence that demonstrates that a person skilled in the relevant art would have been able to determine the operable embodiments from the inoperable embodiments within the scope of the appealed claims without undue experimentation. Mere conclusory statements do not take the place of evidence. *See, e.g., In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997).

Therefore, the teachings provided by the limited examples are not commensurate with the unduly broad scope of the claims.

Similarly, Appellants have not rebutted the showing that one of ordinary skill in the art to which the invention pertains could not practice the invention without undue experimentation, according to the *Wands* factors. *Wands*, 858 F.2d at 735. The quantity of experimentation to determine the properties of the non-spherical particles and non-metallic medium that would achieve the limiting spacing is unknown and presumably unlimited. It appears that a practitioner would have to continue trying various combinations of the two (particles and non-metallic medium) until he stumbled on one having the requisite spacing. Other than the examples cited in the Specification, the Appellants do not point to any teachings in the Specification by which one skilled in the art would select or use particular compositions of particles and mediums to achieve the claimed invention. While several examples are cited in the Specification by the Declarant, the

scope of those examples is very narrow with respect to the breadth of the claimed invention. Nothing in the prior art references, which are notably absent from the Appellants' responses, appears to provide direction or instruction on the limitation. (*See* FF 9, 14). In sum, we find that one of ordinary skill in the art could not practice Appellants' claimed method without first determining the values of many variables. We further find that it would not have been within the level of skill of the ordinary artisan to determine these values from the Specification disclosure without undue experimentation. We therefore determine that, after giving consideration to all the evidence related to the factors set forth in *Wands*, the Appellants have not rebutted the showing that one skilled in the art would not be enabled to practice and use the invention without undue experimentation. Thus, the Examiner's rejection under 35 U.S.C. § 112, 1<sup>st</sup> paragraph for lack of enabling disclosure is sustained.

#### CONCLUSION

The rejection of the claims under 35 U.S.C. § 112, 1<sup>st</sup> paragraph for lack of written description is not sustained. The rejection of the claims under the same section and paragraph for lack of enabling disclosure is sustained. Therefore, the decision of the Examiner is affirmed.

#### TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).



Appeal 2008-1468  
Application 10/663,320

AFFIRMED

tf/lb

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